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High Level and Detailed Design Specification

Wireless 3G NextGen Rel 1.0

PPS ID: 1186   Feature ID: FAS Feature Key Generator

FAS Feature Key Generator HLD-DD

APPROVALS

TITLE	Printed Name:	SIGNATURE:	DATE:
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Exact signatures required will be determined by the EMT Team

DOCUMENT CONTROL:_____RELEASE DATE:_____

RECORD OF REVISIONS

ORIGINATOR:	REVISED SECTION/PARAGRAPH:	REVISION LEVEL:	RELEASE DATE:
Marko Pfaff	Draft	0.0	XXXXXX
Marko Pfaff	Enhanced Section 7, Design	0.1	XXXXXX
Marko Pfaff	Baseline Document for Release Version 1.0	1.0	XXXXXX

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1 Purpose And Overview

This document describes the detailed design and implementation of the FAS Feature Key Generator.

1.1 Executive Summary

This section should list the summary of features supported.

2   Scope

2.1   Intended Audience

This Design Specification document is intended for technical managers, design engineers, test engineers, supporting engineers and technical publications in this project.

2.2   Environment/Infrastructure

The Feature Key Generator is a component of the Feature Activation System. Please refer to the FAS System Functional Specification for a system overview.

2.3   Assumptions

N/A

2.4   Limitations

N/A

3   Defintions

3.1   Acronyms and Abbreviations

This section explains and defines words and acronyms that are used throughout this document that are not found in the Glossary of Terms for Product/Technology Development.

Term	Definition
MSID	Mobile Station ID
IMSI	International Mobile Station Identity [E.212]
MIN	Mobile Identification Number [TIA/EIA-41-E]
IRM	International Roaming MIN [TIA TSB-29]
NAI	Network Access Identifier e.g. "user@realm" [RFC-2486]
3GPP2	3rd Generation Partnership Project 2 (cdma2000)
PDSN	Packet Data Serving Node
BS	Base Station
RN	Radio Network (sets of BS and PCF)
PPP	Point-to-Point Protocol

OAM&P	Operations, Administration, Maintenance, & Provisioning
RADIUS	Remote Authentication Dial In User Service
AAA	Authorization, Authentication, and Accounting
MIP	Mobile IP
IP	Internet Protocol
PCF	Packet Communication Facility – Intermediary network element between a BS and a PDSN
P_i	S.R0005-A Reference Point between PDSN and AAA
$A_{quarter}$	S.R0005-A Reference Point between the BS and the PDSN. It is subdivided into A8 to A11
A8	Interface that carries user traffic between the BS and the PCF
A9	Interface that carries signaling information between the BS and the PCF
A10	Interface that carries user traffic between the PCF and the PDSN
A11	Interface that carries signaling information between the PCF and the PDSN
Actor	Collective term for user, operator, or external system

4   Applicable Documents and External Standards Specifications

This section shall list the number, title, revision and date of all documents referenced in this High Level / Detailed Software Design Specification. This section should include the list below as well as any other applicable documents (i.e. international standards, federal standards, etc).

Number	Title
Q0002D	Carrier System Manual Part 4: DESIGN CONTROL
E0129	Glossary of Terms for Product/Technology Development
3G 3.0 FFD #44	CommWorks Wireless 3G Release 3.0 Feature Functional Description (FFD) for Feature # 44
F0056/S0053	Product Requirements Definition
E0146	System Functional Specification Procedure
E0130	Peer Review Procedure

E0096	Engineering Management Team Guidelines
3GPP2 P.S0001-A-1	Wireless IP Network Standard (a.k.a.TIA/EIA/IS-835)
3GPP2 A.S0001-A	3GPP2 Access Network Interfaces Interoperability Specification
3GPP2 S.R0005-A	Network Reference Model for cdma2000 Spread Spectrum Systems
RFC 1661	The Point-to-Point Protocol (PPP)
RFC 2138	Remote Authentication Dial In User Service (RADIUS)
FAS SyFS	FAS System Functional Specification
FAS Feature Key Generator SFS	FAS Feature Key Generator Software Functional Specification

5   System Functional Overview

The Feature Key Generator is responsible for generating cryptographically signed Feature Keys and Feature Key Files. Please refer to the FAS Feature Key Generator SFS for an overview.

6   High-Level Design

The FKEY Generator shall be realized as a CGI application. It is a single threaded program which performs one thread per HTTP request.

The "FKEYGServer" is logically the server instance which controls the internal management including data flow and object handling.

The "FeatureKey" object is used for modelling the Feature Key. It includes all the Feature Key attributes and methods to control and access these attributes.

The "Repository" is the instance which controls the Feature Key Repository access.

The "UIHandler" includes all GUI related functionality and takes care of preparing the data which will be displayed on the Webbrowser.

7   Detailed Design

The section will contain a detailed description of the components that make up the feature. This could be a detailed description of the State Machine design, Data Flow Diagram, Event Sequence Diagram, Object Modelling, or Psedo Codes, etc. A combination of the above design techniques should be used.
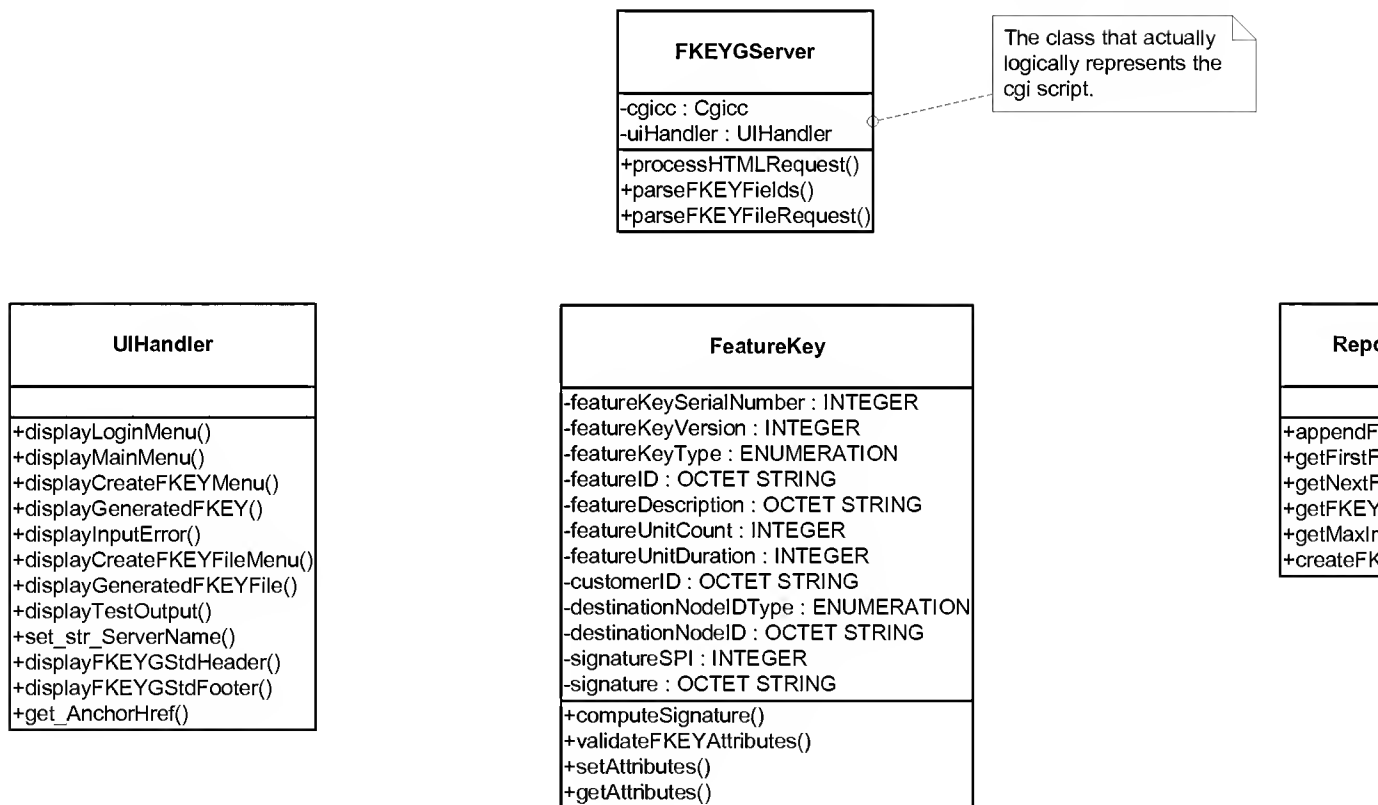
7.1   Applications Program Interfaces

7.2   Major Data Structures

The section will contain a detailed description of the major data structures defined for this feature (if applicable).

7.2.1   FKEY Generator Top Level Class Diagramm

Class Diagram - Feature Key Generator

FKEYGServer

-cgicc : Cgicc
-uiHandler : UIHandler

+processHTMLRequest()
+parseFKEYFields()
+parseFKEYFileRequest()

The class that actually logically represents the cgi script.

UIHandler

+displayLoginMenu()
+displayMainMenu()
+displayCreateFKEYMenu()
+displayGeneratedFKEY()
+displayInputError()
+displayCreateFKEYFileMenu()
+displayGeneratedFKEYFile()
+displayTestOutput()
+set_str_ServerName()
+displayFKEYGStdHeader()
+displayFKEYGStdFooter()
+get_AnchorHref()

FeatureKey

-featureKeySerialNumber : INTEGER
-featureKeyVersion : INTEGER
-featureKeyType : ENUMERATION
-featureID : OCTET STRING
-featureDescription : OCTET STRING
-featureUnitCount : INTEGER
-featureUnitDuration : INTEGER
-customerID : OCTET STRING
-destinationNodeIDType : ENUMERATION
-destinationNodeID : OCTET STRING
-signatureSPI : INTEGER
-signature : OCTET STRING

+computeSignature()
+validateFKEYAttributes()
+setAttributes()
+getAttributes()

Rep

+appendF
+getFirstF
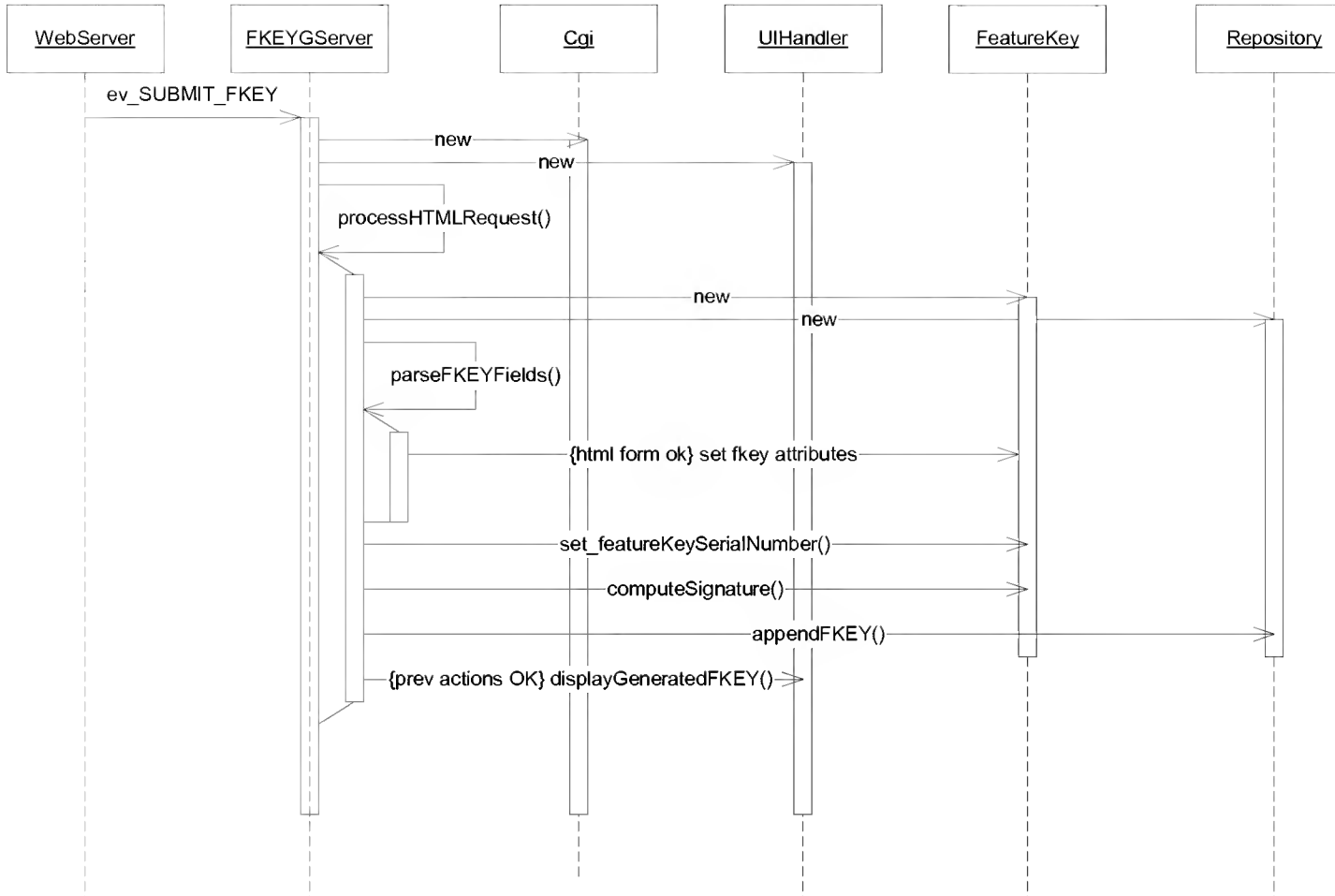+getNextF
+getFKEY
+getMaxIr
+createFK

7.3   Modules impacted

The existing modules that are impacted by this feature should be listed in this section (if applicable)
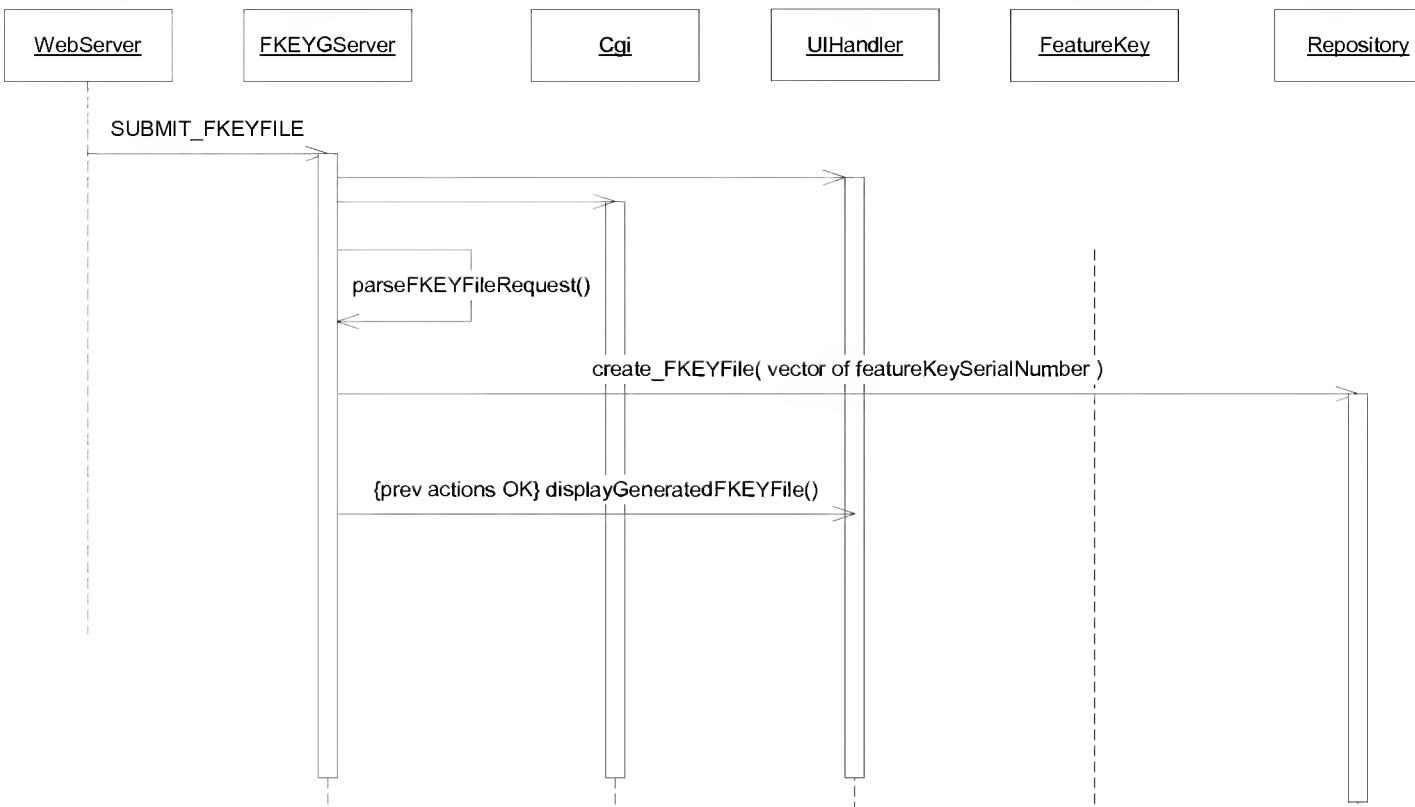
7.4   Sequence Diagrams

7.4.1   FKEY Generator Sequence Diagram - Create Feature Key

Sequence Diagram - FKEYGenerator - createFeatureKey

WebServer	FKEYGServer	Cgi	UIHandler	FeatureKey	Repository

ev_SUBMIT_FKEY

new

new

processHTMLRequest()

new

new

parseFKEYFields()

{html form ok} set fkey attributes

set_featureKeySerialNumber()

computeSignature()

appendFKEY()

{prev actions OK} displayGeneratedFKEY()

7.4.2   FKEY Generator Sequence Diagram - Create Feature Key File

Sequence Diagram - FKEYGenerator - createFeatureKeyFile

WebServer	FKEYGServer	Cgi	UIHandler	FeatureKey	Repository

SUBMIT_FKEYFILE

parseFKEYFileRequest()

create_FKEYFile(vector of featureKeySerialNumber)

{prev actions OK} displayGeneratedFKEYFile()

8   RADIUS Attributes Support

This section should include all the Radius Attributes that are supported by this feature.

9   Configuration and Command Line interfaces

This section describes all the configurations and CLI commands for this feature.

10 MIB Definitions

This section contains the MIB definitions in detail for this feature.

The description of the MIB objects should be as complete and as detailed as possible, which will be reviewed by MIB Guardians, Product Manager and Tech Comm people.

11 Detailed SYSLOG information

This section should include a detailed description of at least the following four levels of syslog criticality of events: CRITICAL, UNUSUAL, COMMON, and INFORMATIONAL.

12 Debuging Facilities

This section should include a detailed description of the debugging facilities available to the developers and the testers other than the Syslog information, such as built-in test, MIB counters, and built-in traces, data structure audit, hidden commands. etc.

13 Unit Test Plan and Test Cases

Each module or feature that is developed in the Wireless projects will undergo unit testing. The unit testing to be carried out for this feature will be described in detail in this section. Please specify the unit test plan and test cases as complete as possible. This section will be reviewed with the peer engineers and ITG engieers.

13.1 Use Case: Login

1) Use the URL address in your webbrowser:

http://ServerName/~fkeyg/cgi-bin/FKEYGServer.cgi

2) Click on "Enter"

Verify that the display "Feature Key Main Menu" appears.

13.2 Use Case: Create Feature Key

In "Feature Key Main Menu":

1) Click on "Create a Feature Key"

2) Fill in the Feature Key parameters

3) Click "Submit"

Verify that the display "Generated Feature Key" displays the correct Feature Key parameters.

13.3 Use Case: Create Multiple Feature Keys

1) Repeat Use Case: Create Feature Key

Verify that many Feature Keys can be created.

Verify that Feature Keys with different parameters can be created.

Verify that the featureKeySerialNumber is unique for each Feature Key.

13.4 Use Case: Create Feature Key File

In "Feature Key Main Menu":

1) Click on "Create a Feature Key File"

2) Select one or multiple Feature Key(s) from the list

3) Click "Submit".

4a) Click on "Download Feature Key File" to view the Feature Key File.

4b) Click on "Download Feature Key File" to download the Feature Key File.

5) Click "Continue"

Verify that the FKEY File can be viewed.

Verify that the FKEY File can be downloaded.

Verify the content and syntax of the FKEY File.

14 Memory And Performance requirement

N/A

15 Other Considerations and Constraints

N/A